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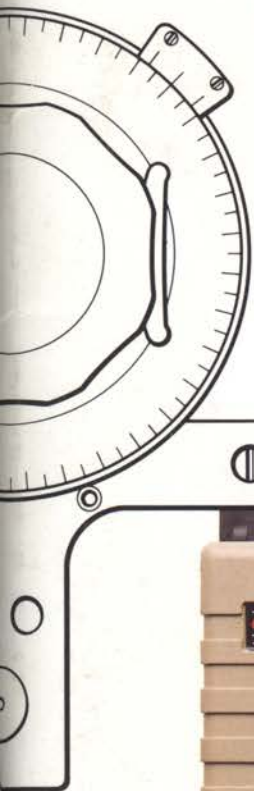
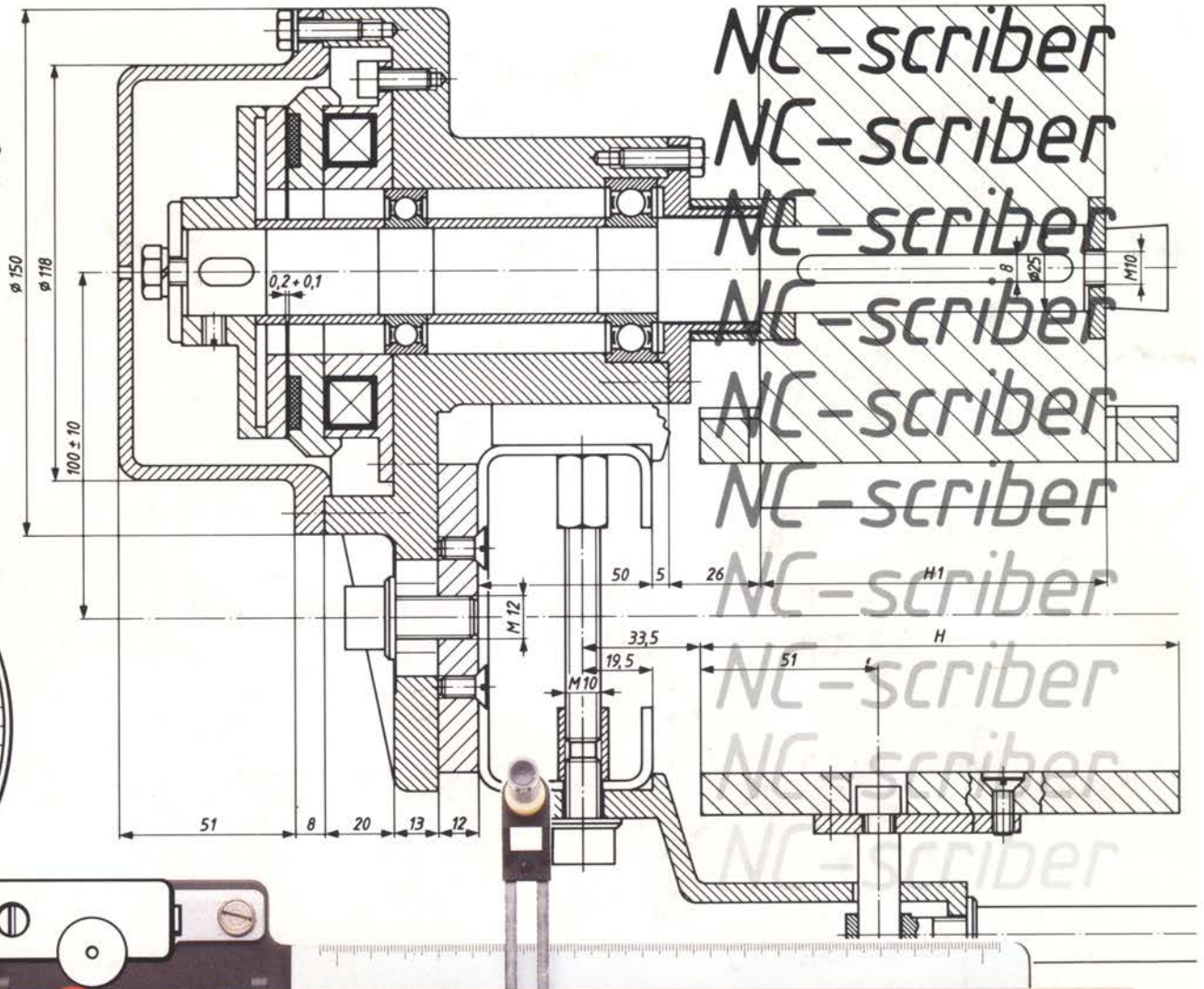
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Section A-B



## Operating Instructions

### NC-scriber 10

Art. No. 691 588

Mat. No. 463 7353

NC-scriber

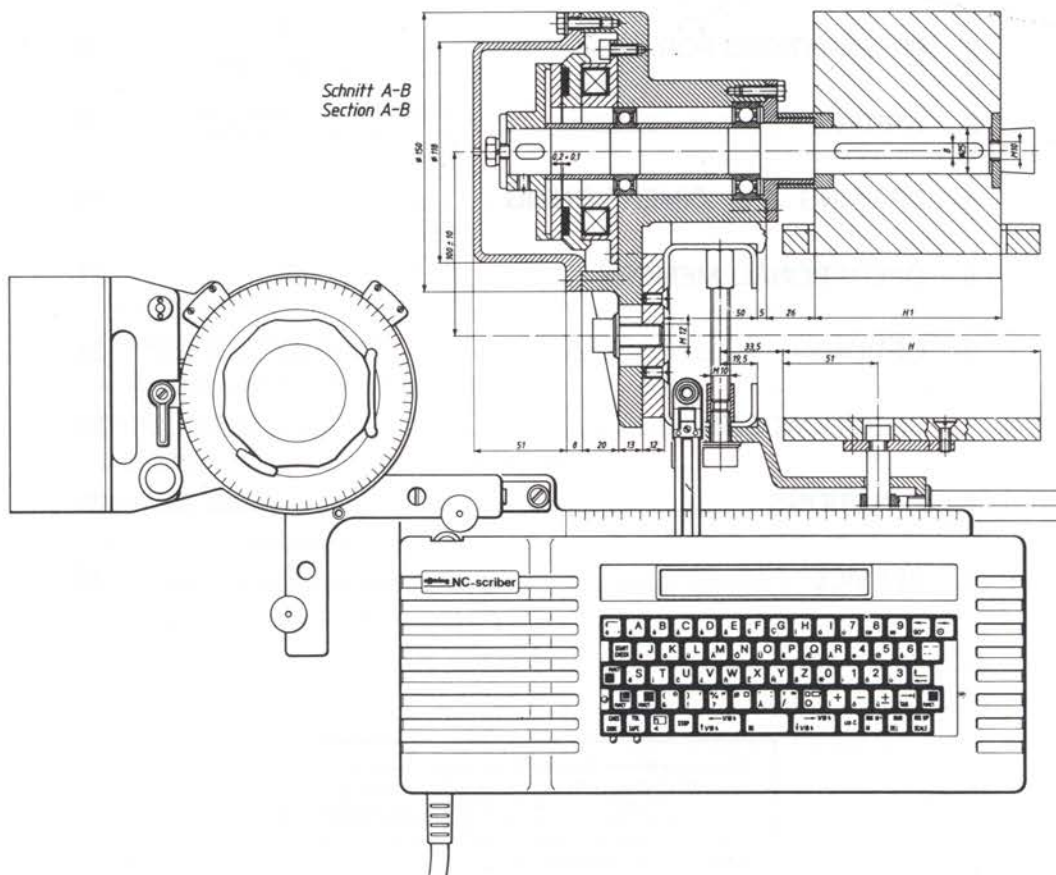
NC-scriber

NC-scriber

# rotring NC-scriber 10

# Operating Instructions

Art.No. 691 588



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Specifications subject to change.

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## 1.1 Introduction

The rotring NC-scriber 10 is a computer-controlled lettering and drawing machine. Characters, figures and symbols are drawn at the touch of a button.

The NC-scriber relieves the user of tedious routine work while rendering characters and drawings with utmost precision.

Technical drawing pens with standard threads or fibre-tip pens can be used as scribing tools.

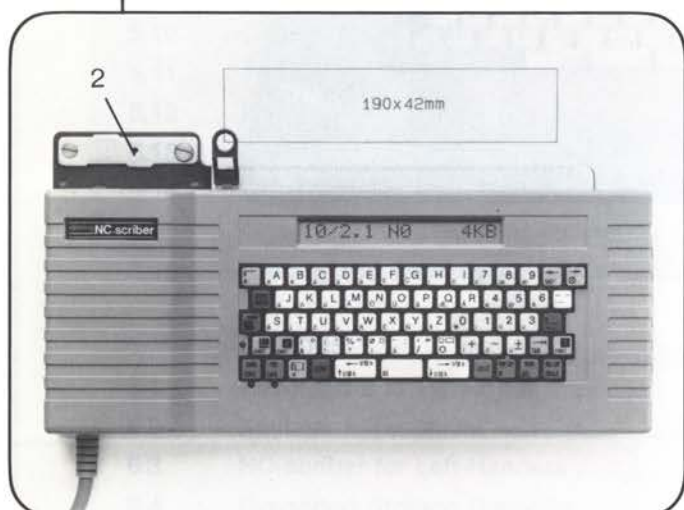
These instructions cover all major functions of the rotring NC-scriber 10 as well as options to expand the capabilities of the system.



### 1.2 Standard Model

The standard model of the rotring NC-scriber 10 comprises:

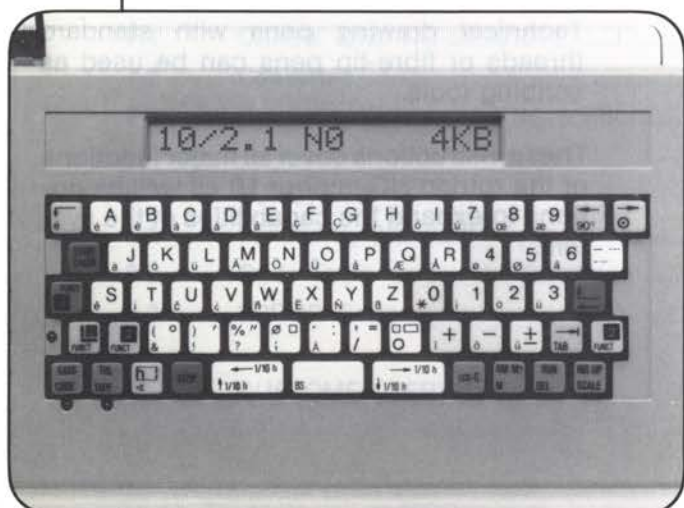
1. The NC-scriber operating unit
2. The NC-ad 1010 control unit
3. Power cable
4. Control cable
5. A bracket for fastening the control unit to the rear of the drawing board



### 1.3 Operating Unit

The NC-scriber operating unit includes:

1. **Chuck plates and parts** required for attaching the NC-scriber to the drafting head of the drafting machine
2. **Adhesive-backed cable clamps** for fastening the control cable



### 1.4 Keyboard

The keyboard has input and function keys. Red light-emitting diodes (LEDs) signal when specific functions are actuated. The 16-character liquid crystal display (LCD) permits a check of all input prior to keying it into memory and can be used to display contents and free capacity of the memory.

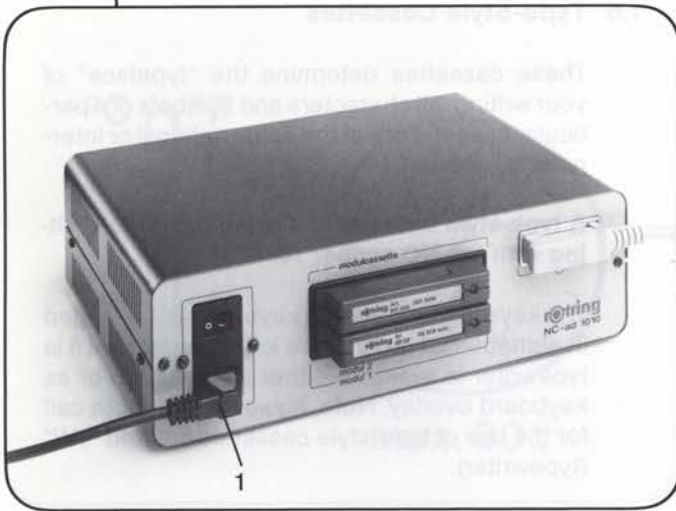
The scriber arm accepts either technical pens or an adapter for fibre-tip pens.

For a key-by-key description, see Sect. 8.

### 1.5 Control Unit

The NC-ad 1010 control unit includes:

1. **The power cable**
2. **Spare fuses, 1.6 A delayed**
3. **A bracket for fastening the control unit to the rear of the drawing board.**

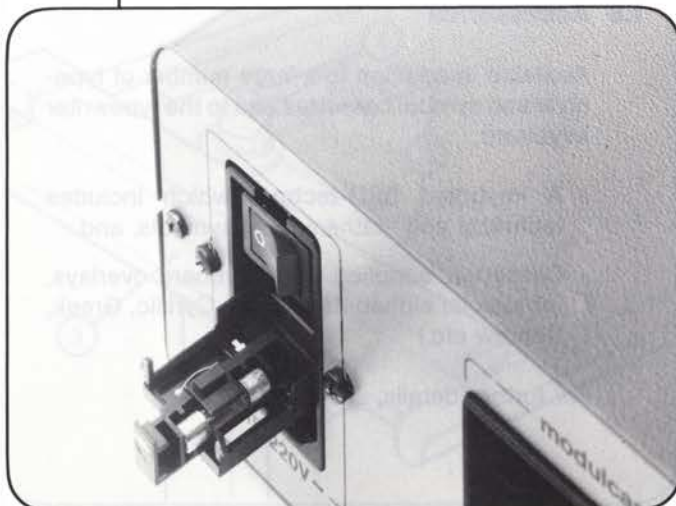


Controls at the front panel:

1. **Socket for plug of power cable**
2. **Power ON/OFF switch with fuse**
3. **Plug-in slots with sockets for 2 cassettes**
4. **Socket for plug of control cable**

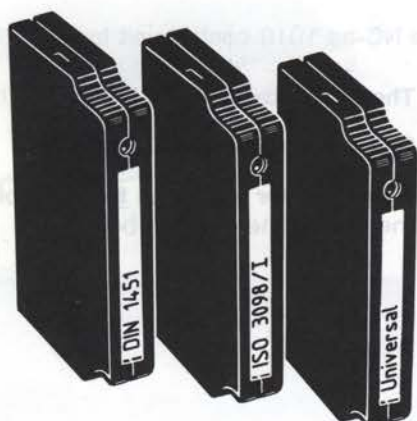
#### Attention

**Switch off power at the control unit before disconnecting the control cable.**



To exchange the fuse (1.6 A delayed), open the hinged front of the power switch and pull out the fuse.

The voltage switch is at the rear of the control unit. Set it to the local voltage (115 or 220 V) before starting operations.



### 1.6 Type-Style Cassettes

These cassettes determine the "typeface" of your writing: all characters and symbols of a particular cassette are of the same national or international standard.

**A type-style cassette is a prerequisite for writing with the NC-scriber 10.**

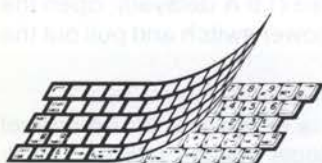
The keys on the standard keyboard are arranged in alphabetical order, but a key arrangement à la typewriter is available either as keyboard or as keyboard overlay. Note, however, that both call for the use of type-style cassettes marked "TW" (typewriter).



### 1.7 Standard Cassettes

Standard cassettes offer a wide range of technical symbols. The size of the symbols can be varied.

For details, see Sect. 4.7.



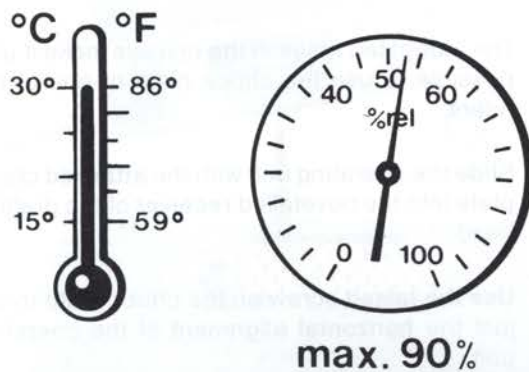
TW

### 1.8 Accessories

Available in addition to a large number of type-style and symbol cassettes and to the typewriter keyboard:

- A keyboard "ISO-techn.", which includes technical and mathematical symbols, and
- Cassettes, supplied with keyboard overlays, for special alphabets (Arabic, Cyrillic, Greek, Hebrew etc.)

For further details, see Sect. 6.



### 2.1 Environmental Requirements

The rotring NC-scriber 10 is designed for use in offices or rooms where the temperature is between 15 °C and 30 °C and the relative humidity max. 90%.

#### Attention

**Avoid direct exposure to radiant heat.**

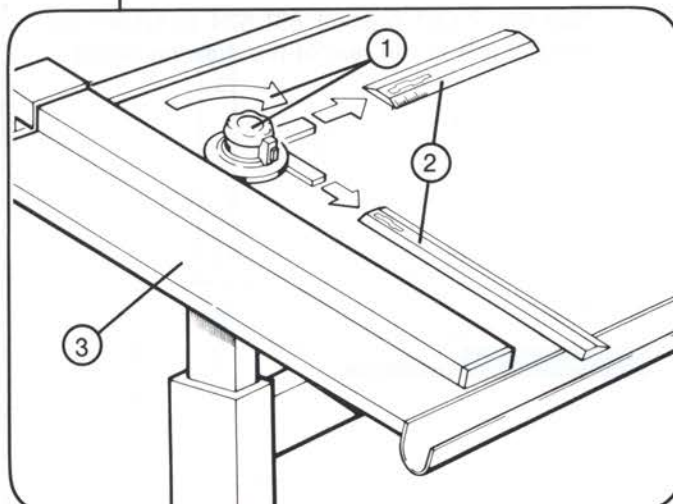


### 2.2 Connecting the Mains Cable

Before connecting the mains cable, set the voltage switch (at the rear of the control unit) to the local mains voltage.

#### Attention

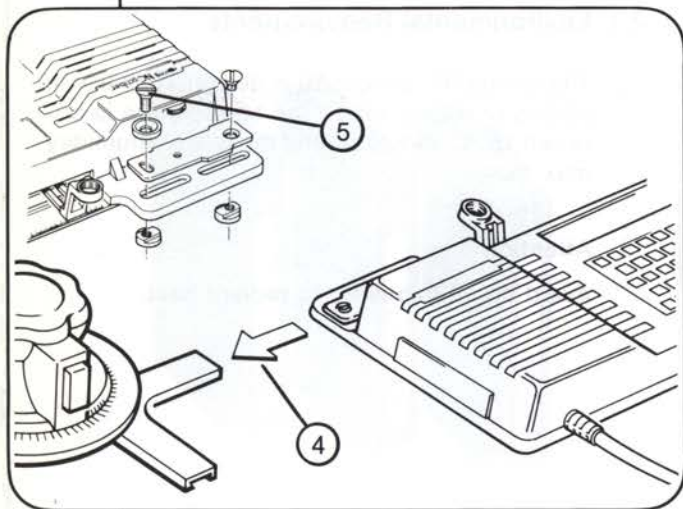
**Connect the operating unit before switching on power.**



### 2.3 Attachment to the Drafting Head

Before attaching the operating unit:

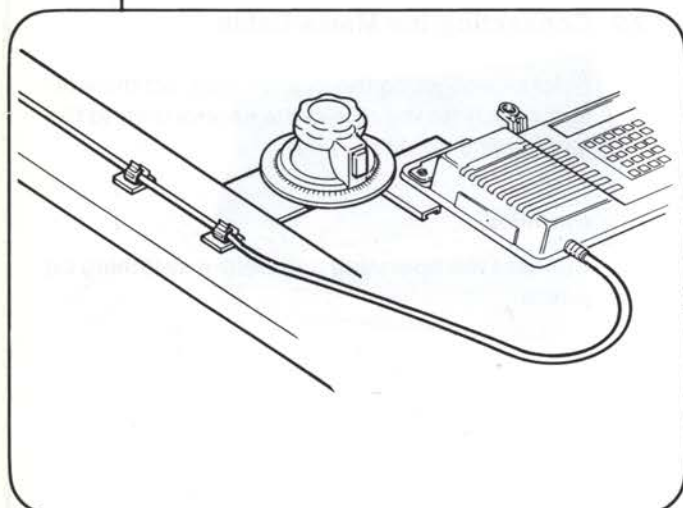
- ① **Bring the drawing board** into an almost **horizontal position**.
- ② **Remove the rulers** from the drafting head.
- ③ If necessary, **rotate the drafting head** by 90°.



An assortment of chuck plates fitting various drafting machines is provided with the NC-scriber 10.

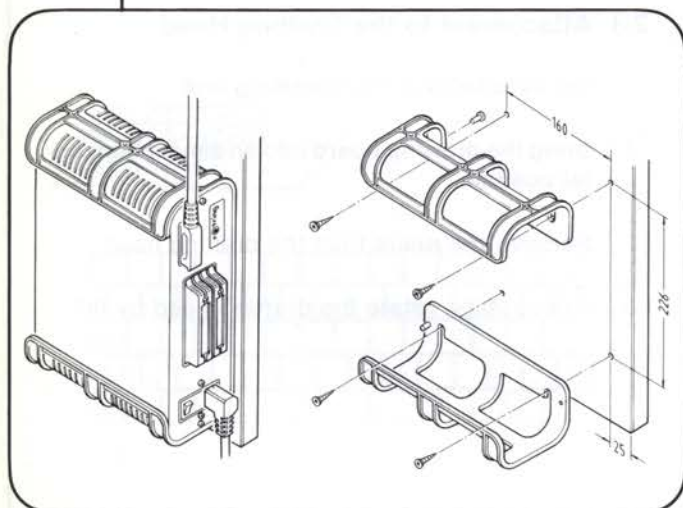
The elongated holes in the chassis make it also possible to use the chuck plate of one of the rulers.

- 4 **Slide** the operating unit with the **attached chuck plate** into the dovetailed **receiver** of the drafting head.
- 5 **Use the raised screw** on the chuck plate to adjust the **horizontal alignment** of the operating unit.

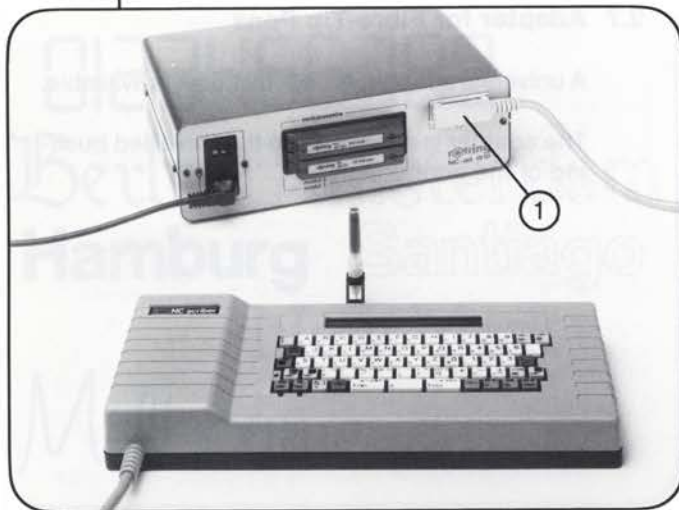


Adhesive-backed cable clamps are provided for fastening the control cable to the carriage of the drafting machine.

Routing the cable along the carriage and over the top of the drawing board will keep it from interfering with work.

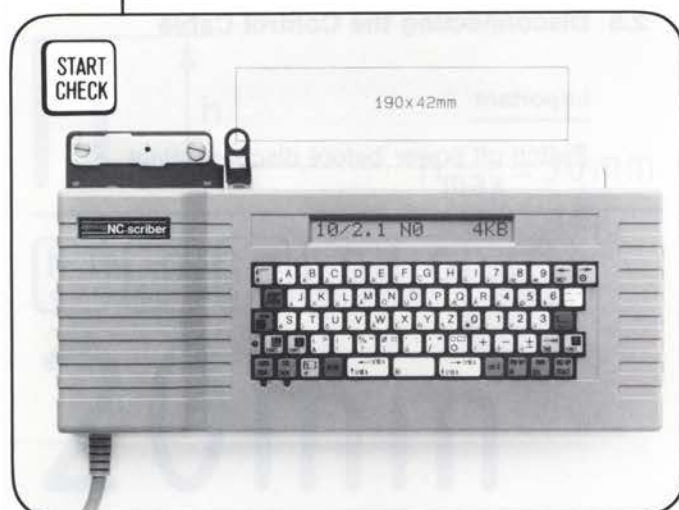


Use the 2-part bracket 691 524 to fasten the control unit to the rear of the drawing board.



### 2.4 Connecting the Control Cable

- ① Insert the connector in the socket of the control unit.



### 2.5 Preparations for Writing

- ① Insert a type-style cassette into the cassette slot.

#### Note

If 2 different type-style cassettes are inserted, the lower one will be used first. To switch to the upper one, use code 07 (see also Sect. 4.7).

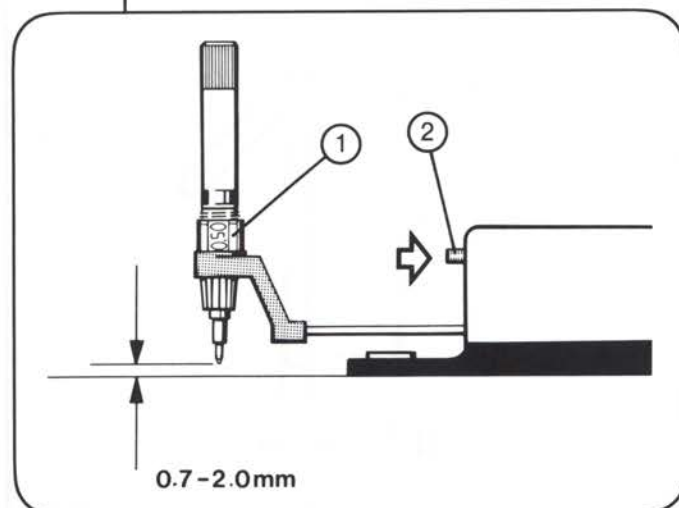
- ② Switch on the power (control unit).

The LCD shows a system message which includes instrument model, series, software stand and storage capacity.

- ③ Press **START CHECK**.

The scriber arm moves to the start of the 1st line.

The initial character height is 3.5 mm.



### 2.6 Inserting the Scribing Tool

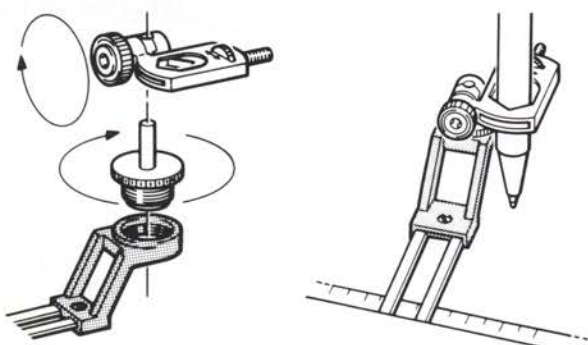
A technical drawing pen can be inserted directly into the scriber arm.

- ① Screw the drawing pen (barrel removed) fully into the threaded bushing.

#### Note

Do not twist at the reservoir.

- ② Using the height adjustment screw, adjust the height of the tip of the drawing pen to about 1.5 mm.



### 2.7 Adapter for Fibre-Tip Pens

A universal adapter, Art.No. 691 659, is available.

The adapter is screwed into the threaded bushing of the scriber arm.

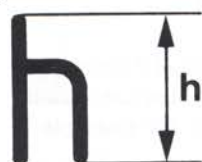


### 2.8 Disconnecting the Control Cable

#### Important

Switch off power before disconnecting!

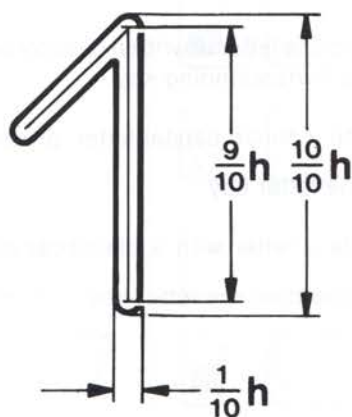
0123456789  
 Berlin Amsterdam  
 Hamburg Santiago  
 New York  
 Melbourne



$h_{\max} = 30 \text{ mm}$



20mm



### 3.1 Type Style

The style of your writing (also called "font" or "typeface") is determined by the type-style cassette you select.

A type-style cassette is a prerequisite for writing with the NC-scriber.

For information about type-style cassettes, ask for the special rotring catalog NC-cassettes "Schriften" (type styles), Art.No. 981 751.

### 3.2 To Select the Character Height

Pressing **START CHECK** will result in vertical characters of 3.5 mm height. To select any other character height up to 30 mm:

- ① Press **[h]**.
- ② **Key in the character height** with an accuracy of 1/10 mm and as a 4-digit number.

#### Note

If the input exceeds the max. character height, the beeper will sound, the LCD will indicate ERROR, and the input will be ignored.

#### Note

To attain precisely the selected character height  $h$ , use a drawing pen of line thickness  $1/10 h$ .

The maximum character height is limited by the range of the scriber arm:

Capital letters,  $h = 30 \text{ mm}$

Capital letters with diacritical marks,  $h = 25 \text{ mm}$

#### To select the character height in inches

- ① Press **[h]** **[.]**.
- ② **Key in the inch height** as a 4-digit decimal number.

Example:  $1/2" = 0.5" = 0050$

**Examples:**

Regular (100%)	100
Condensed (70%)	070
Extended (140%)	140

NC-scriber 10  
 NC-scriber 10  
 NC-scriber 10

### 3.3 Extended / Condensed Writing

The width of characters can be varied in 1% steps.

The height h of the characters remains unchanged.

Extended/condensed writing can be stored in memory.

- 1 Press .
- 2 Key in code .
- 3 Key in the desired width as a 3-digit percentage.

### 3.4 To Select the Writing Speed

The regular writing/drawing speed of 2 cm/s can be reduced to 0.5 cm/s, a useful feature when working with "slow" etching inks, for example.

Keys have multiple functions

Direct input : Press input key

2nd function : followed by input key

3rd function : followed by input key

### 3.5 Capital and Lowercase Letters

A lowercase letter is written directly upon pressing the corresponding key.


To write a single capital letter, press and then the letter key.


To write a letter with a diacritical mark, press and then the letter key.

é A è B á C à D abcd

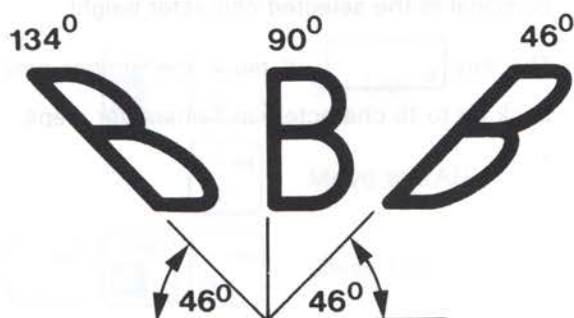
 é A è B á C Abc

  é A è B á C ABC

To write **more than one CAPITAL LETTER** in succession, press  and then the desired letters. A red LED near the function key indicates that the 2nd function is activated.

To cancel the function, press again .

  \* 0 ú 7 0 5 75°



### 3.6 Italics

① Press  .

② Key in the inclination as a 3-digit number.

Input can be specified to within 1°

Italics to the right, max. 46°

Italics to the left, max. 134°

The angle of inclination can be stored in the operational memory.

#### Note



The starting point of a character automatically shifts to the right when an inclination to the left is keyed in.

If the input exceeds the limits of inclination, the beeper will sound, the LCD will indicate ERROR, and the input will be ignored.





### 3.7 Punctuation Marks and Special Symbols

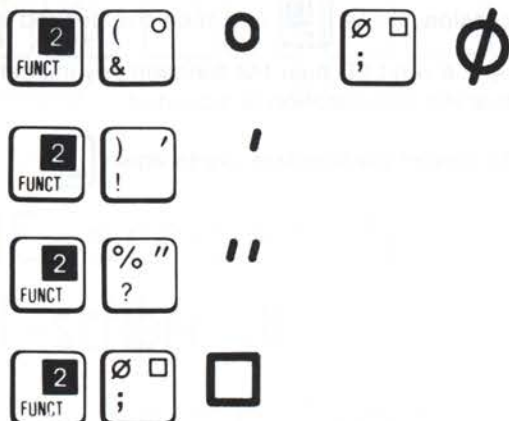
Frequently used punctuation marks, e.g. full stop or comma, are written directly upon pressing the key.

Lesser used symbols are written after pressing

 or .

This principle also applies to all other symbols.

· : Ä	.	 ) '	!
' = /	,	( ° ) '	( )
 · : Ä	:	% " ?	%
 % " ?	?	 ( °	&



### 3.8 Technical Symbols


These symbols include:

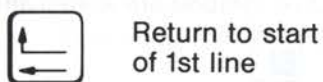
- Degree, minute (or foot), second (inch)
- Diametre symbol
- Square-profile symbol.




### 3.9 Spacings and Backspacing

Spacings between characters and words are in accordance with applicable standards and proportional to the selected character height.


The key  will move the scribe arm back up to 16 characters in 1-character steps.

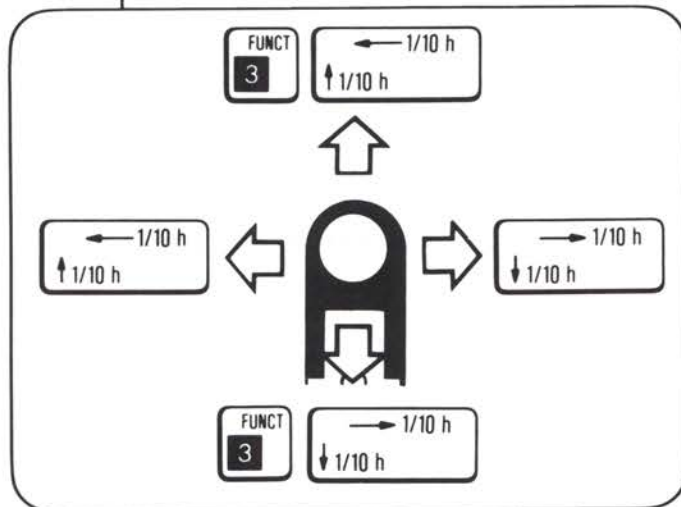


### 3.10 Line Change, Return of Scriber Arm

To move the scribe arm to the start of the next line, press .

The line spacing will always be proportional to the character height, i.e. 1.6 h.

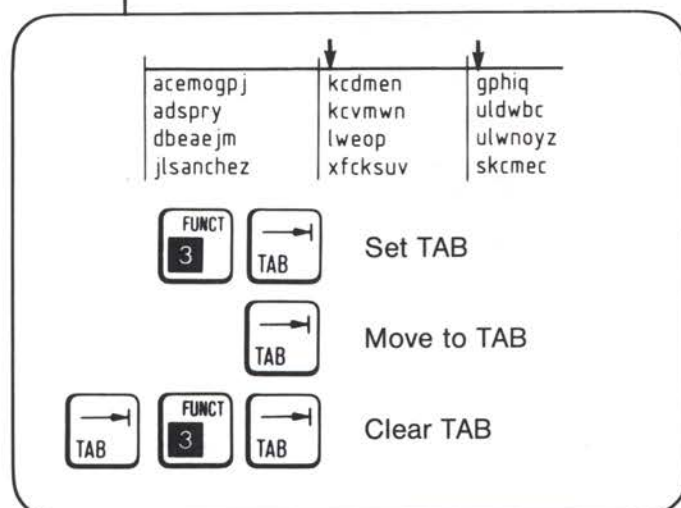
To return the scribe arm to the start of the first line or to the start of the line just written, press .




### 3.11 Positioning the Scriber Arm

The scriber arm can be moved in 4 directions in precise steps of 1/10 of the selected character height.

Pressing the key once results in 1 step, holding it down in a repetition of steps.

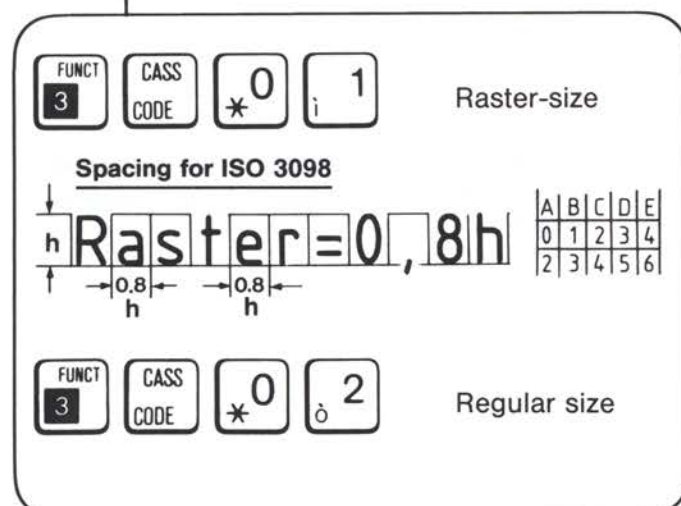


### 3.12 Tabulator

Ten TAB settings can be fixed (e.g. for writing columns or tables) by means of key .



#### Note

Switching off power will clear the TABs. However, TAB settings as well as entire tables can be stored after opening up a memory address.



### 3.13 Raster-Size Characters

This is a function for writing characters and symbols in a grid pattern of identical spacings, e.g. in columns.

To activate the function, press   followed by the code number.

The function can be stored in the operational memory.

The raster spacings for various type styles are shown on the next page.



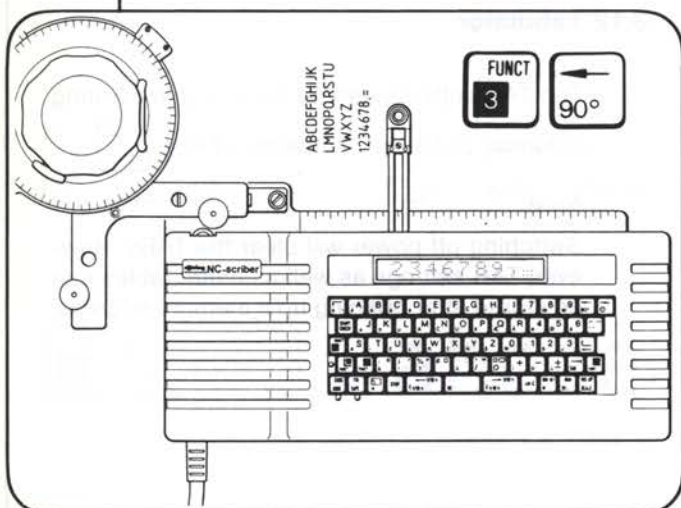
Type style	Raster width
ISO 3098	A = 0.8 h
DIN 17	A = 1.0 h
DIN 1451	A = 1.35 h
Universal	A = 1.0 h

The spacing between raster-size characters is always identical, but it varies with the type style.

The function can be stored in the operational memory.

### Note

Return to regular character size before closing the memory.



### 3.14 Rotation of Writing Direction

The writing and drawing direction can be rotated in 90° steps.

- 1 Press **FUNCT** **3** **90°**.
- 2 Key in the angle as a 3-digit number:

90° = 090

180° = 180

270° = 270

Any other value will be rounded off to the one of the above that is nearest.

- 3 To return to the horizontal left-to-right direction, press **FUNCT** **2** **90°**.

### Important

If storing a rotated text, key in the horizontal left-to-right direction again before closing memory.

abcdefg abcdefg  
 abcdefg abcdefg  
 abcdefg abcdefg



(h=10mm)

### 4.1 Drawing Lines

Use key to draw the following lines:

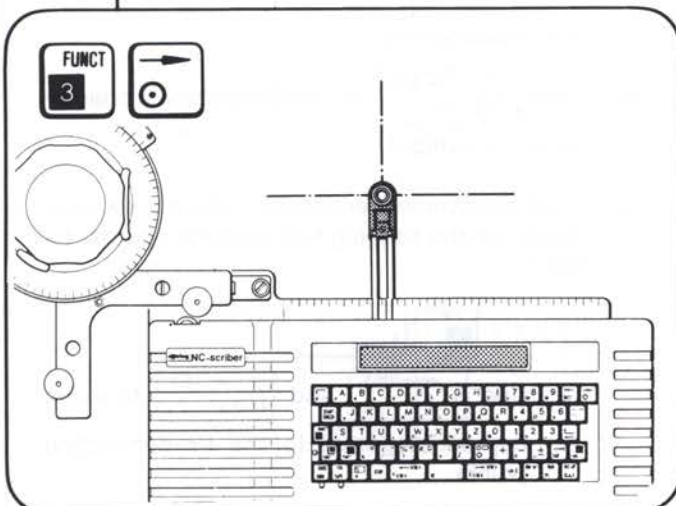
- Continuous
- Intermittent
- Dash-dot-dash.

The length of the line is determined by holding down the key.

#### Note

Drawing speed and writing speed are identical (see Sect. 3.4).

Spacings of line elements of the 2 intermittent lines will be proportional to the selected character height.



### 4.2 Drawing Circles

- 1 Press .

The scriber arm moves into starting position.

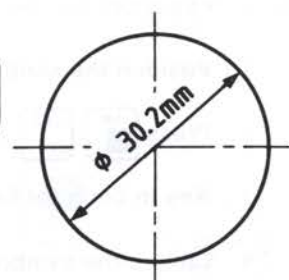
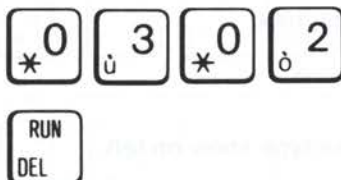
- 2 Centre the tip of the scribing tool over the cross by moving the operating unit.

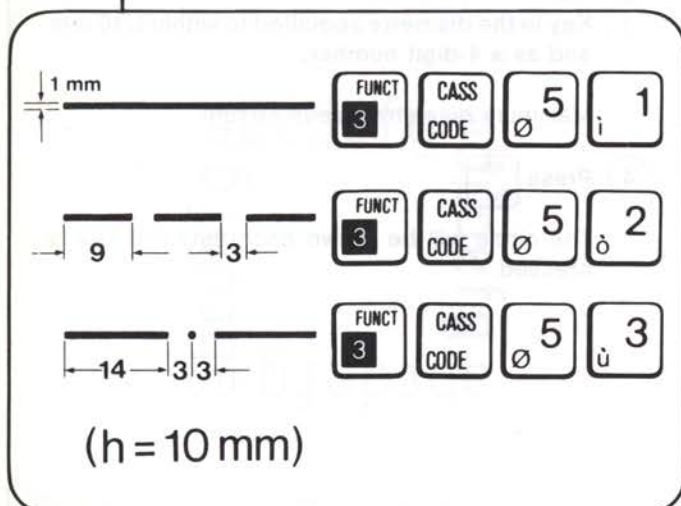
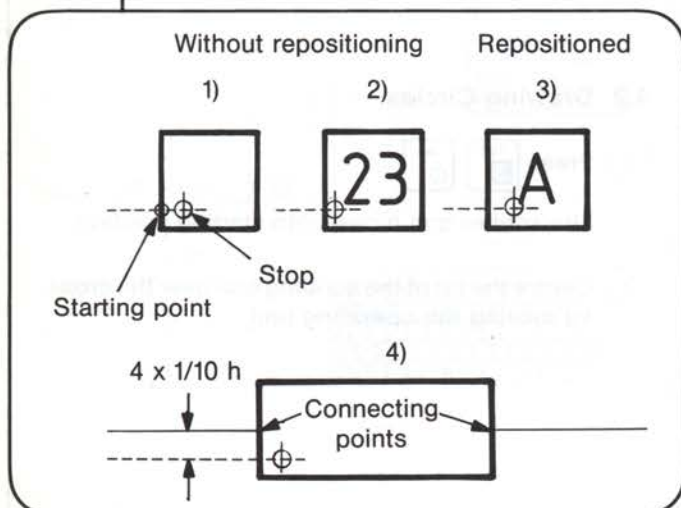
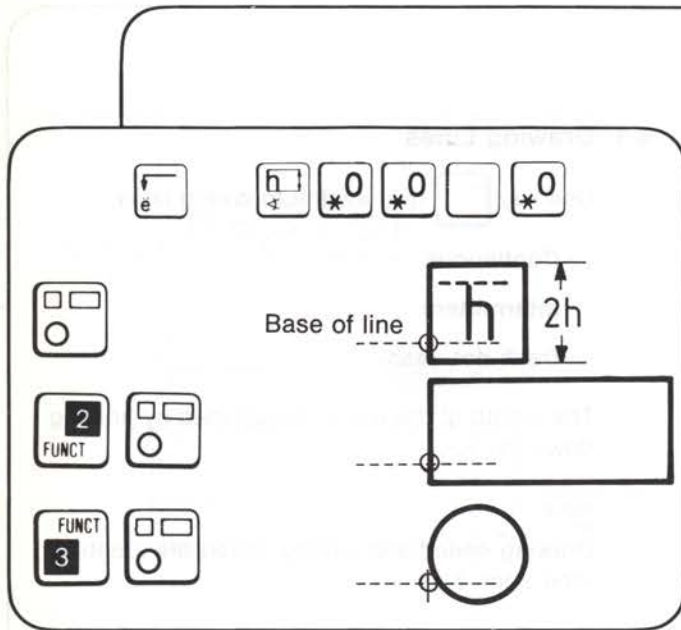
- 3 Key in the diameter specified to within 1/10 mm and as a 4-digit number.

Maximum diameter size is 40 mm.


- 4 Press .

The circle will be drawn each time the key is pressed.





### 4.3 Framing, Circling

The symbols depicted on key  will be drawn twice the selected character height. Therefore:

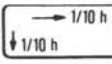

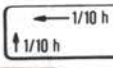
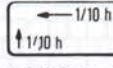
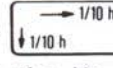
- 1) Press  prior to .

#### Hints for inserting the character(s)

*Without repositioning the scribing tool:*

- 1) The starting point of the first character is where the scribing tool stops after drawing the frame.
- 2) A symbol will accommodate
  - 2 characters (square or circle)
  - 6 characters (rectangle).



*With repositioning:*

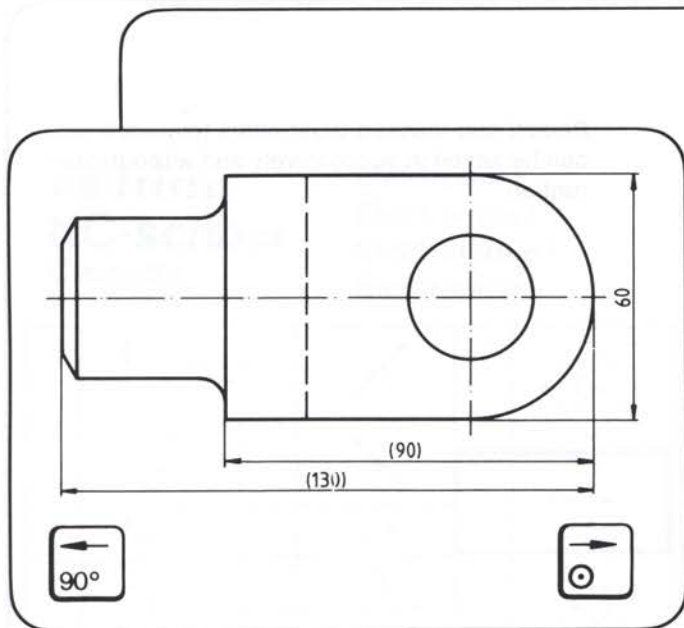
- 3) Use key  for centring a single character in the symbol.
- 4) To tie in a symbol centred on a line in the X-axis, reposition the scribing tool upwards approx.  $4 \times 1/10 h$ :
  - 1) 4 x  .
  - 2) Use  and  to move the scribing tool to the l/r connecting points.

- 2) Insert the character(s).

### 4.4 Line Types for Symbols

Circles, rectangular symbols and symbols from cassettes can be rendered in 3 line types.

- 1) Position the scribing tool.
- 2) Press  .
- 3) Key in code for line type show on left.
- 4) Call up the symbol.

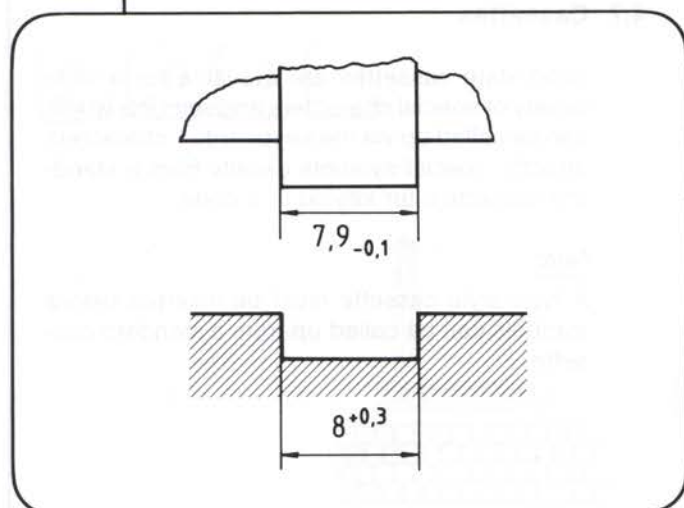


#### 4.5 Dimension Lines with Arrows

Use keys . The arrows will be drawn in proportion to the selected character height and centred on the base of the line being used.

The length of the dimension line is determined by holding down the key.

Maximum arrow size is proportional for a 20 mm character height.

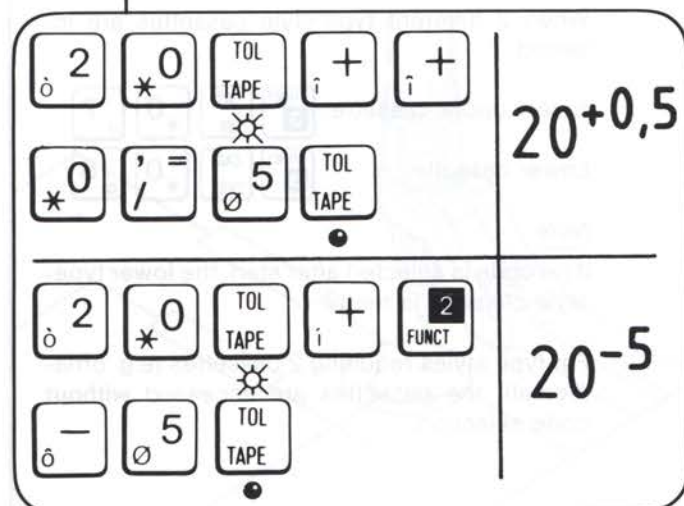


#### 4.6 Tolerance Data, Subscripts, Superscripts

The max. character height for tolerance and superscript/subscript data is 10 mm.

Use key to reduce the character height by the factor 0.7. The red LED next to the key indicates activation of the function.

Press again to deactivate the tolerance function and return to full character height.

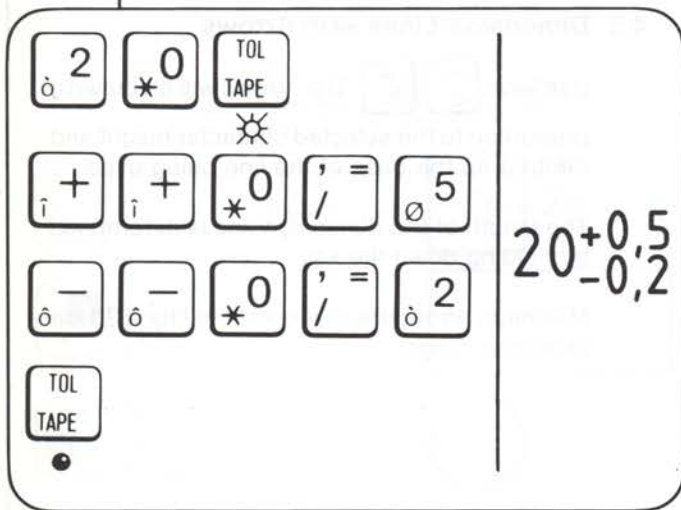


Pressing key / will raise / lower a superscript/subscript.

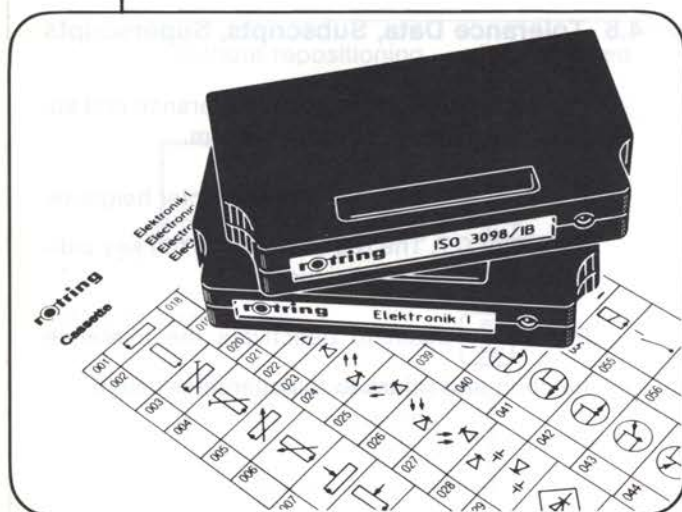
The plus or minus symbol will be written when the key is pressed again.

The symbol  $\pm$  will be written centred on the character height.

To raise a minus sign or to lower a plus sign, first press .



Raised and lowered plus/minus tolerance data can be keyed in successively and without interruption.

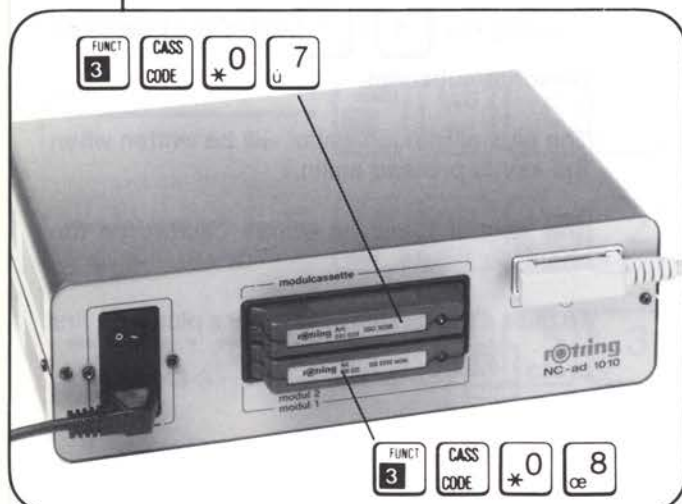


### 4.7 Cassettes

Solid-state cassettes are available for a wide variety of special characters and symbols which can be called up via the keyboard — characters directly, special symbols usually from a standard cassette after keying in a code.

#### Note

A type-style cassette must be inserted before symbols can be called up from a standard cassette.



When 2 different type-style cassettes are inserted:

Select upper cassette: FUNCT 3 CASS CODE \* 0 7

Lower cassette: FUNCT 3 CASS CODE \* 0 8

#### Note

If no code is selected after start, the **lower** type-style cassette is ready.

For type styles requiring 2 cassettes (e.g. ornamental), the cassettes are accessed **without** code selection.

**rotring**  
**NC-scriber**  
Cassette

Elektronik I  
Electronics I  
Electronique I  
Electrónica I

001		018		030	
002		019		031	
003		020		032	
004		021			

### 4.8 Calling Up Symbols from Standard Cassettes

#### ① Insert a standard cassette into the control unit.

- For code number and starting point of each symbol, see the code card.

- Each time keys are pressed, the symbol will be rotated counterclockwise by 90° (i.e. 090°, 180°, 270°).

- To change the scale of a symbol, press keys followed by the change as a 3-digit percentage.

#### ② Press .

#### ③ Key in the code number.

- The scriber arm moves to its starting position.

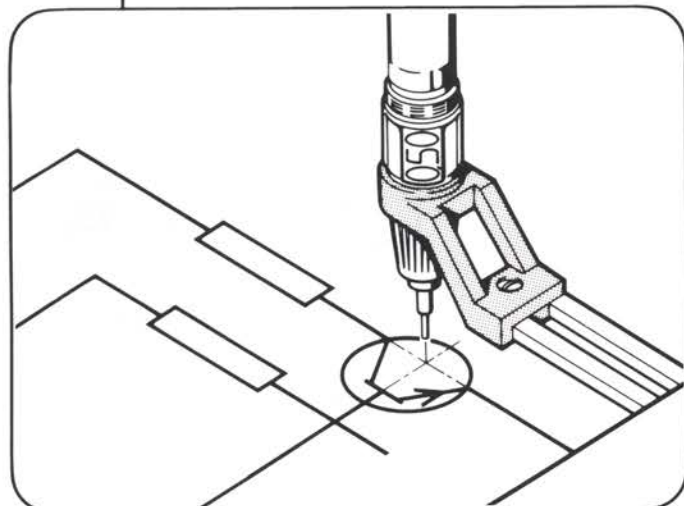
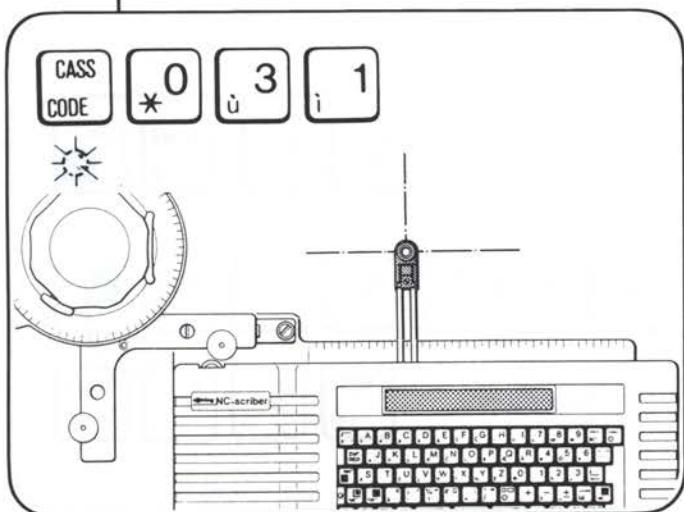
#### ④ Move the NC-scriber to position the tip of the scribing tool over the starting point in the drawing.

#### ⑤ Press to draw the symbol.

The symbol will be drawn each time the key is pressed.

#### ⑥ To call up a different symbol, key in the new code number and do again steps ④ and ⑤ .

#### ⑦ To leave the standard-cassette programme, press .





M

RM M?  
M

Memory Address

<b>FUNC</b> 3	RM M? M	i 1	o 2	+ Input
<b>2</b> FUNC	RM M? M	i 1	o 2	' = i 1 o 2
RM M? M	i 1	o 2	RUN DEL	= Output

Activate memory

**FUNC** 3   RM M? M   —   —

All addresses erased

Full capacity available

### 5.1 Operational Memory, General

Capacity: 4 Kbyte, sufficient for about 2500 instructions, accessible via 99 addresses.

Addresses are keyed in as 2-digit numbers from 01 to 99.

Data will be retained for 2 years after switching off power even if the NC-scriber is never used during that time.

#### Important

**Replace the buffer battery of the memory after approx. 2 years.**

**Avoid loss of memory contents when replacing the battery!**

Use key **RM M? M** for access to the operational memory. The functions are:

**RM** = Output of the contents of one memory address.

**M?** = (2nd function): Call-up for reading the memory contents on the LCD.

**M** = (3rd function): "Clear memory", or access to an address for input.

### 5.2 Activation of Memory

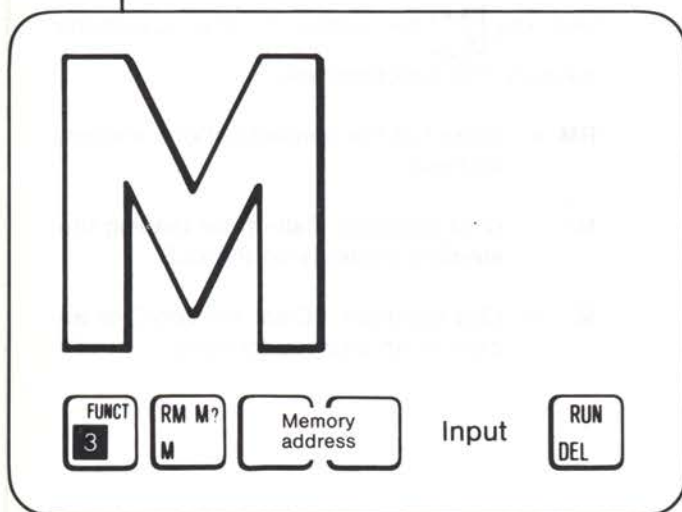
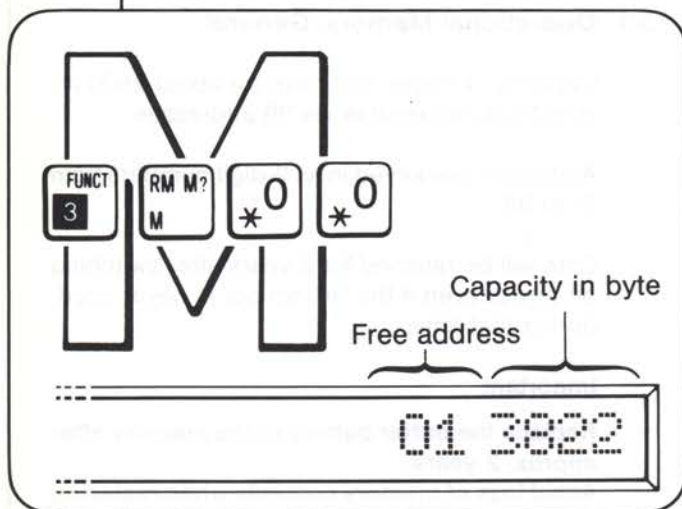
Prior to the first use of a new NC-scriber, press

**FUNC** 3   RM M? M   —   —


to activate the memory.

#### Important

**If a memory contains data, the initial activation will erase it and set all addresses to zero.**

[illegible]


### 5.3 Checking Free Memory Address and Memory Capacity

- ① Press  for access to memory.

- ② Press  $\boxed{*0}$   $\boxed{*0}$ .

The LCD will display the next available memory address and the free capacity in bytes.

Input can commence immediately and will go into the address shown.

- ③ To conclude input into memory, press .

## 5.4 Input into Memory

- 1 Press **FUNC** **3** **RM M?** **M**

- ② **Key in memory address** as a 2-digit number from 01 to 99.

- ③ **Commence input.**

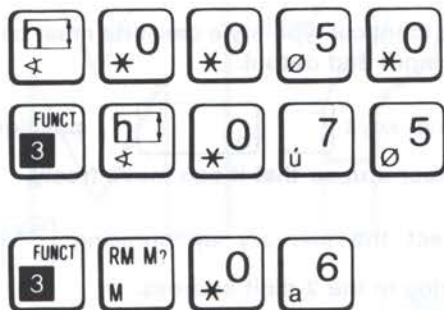
The input is immediately executed to allow control.

The last character height entered is used.

- ④ Close memory by pressing .

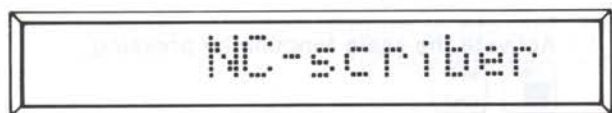
When several addresses are used, a memory log simplifies retrieval of the stored data:

- Memory address
- Memory contents
- Type-style cassette
- Character height
- Scale
- Name
- Date



### 5.5 Storage of Text

- ① **Key in character height and (if desired) inclination.**
- ② **Select the memory** by pressing and keying in the 2-digit address.



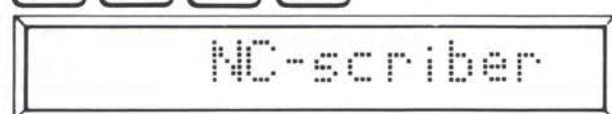
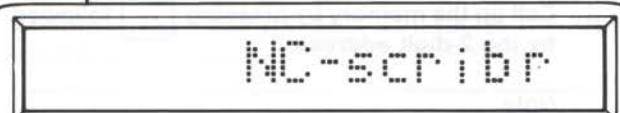
- ③ **Key in the text.**

#### Note

The scriber arm writes along during input to indicate the required space.

Pressing will cause the scriber arm to go through the writing motion with PEN UP. Pressing these 2 keys again will lower the scriber arm.

The beeper will sound about 6 spaces before reaching the end of a line. On the LCD, a black space appears in the last position.



NC-scriber

- ④ **Check the text on the LCD.** To erase an error, press and key in the correct data.

- ⑤ **Conclude memory input by pressing** .

- ⑥ **Press again** **to start output.**

The scriber arm will continue to move forward from the position of its last stop.

#### Recommendation

Keep a log of all stored data.

RM

RM M?  
M

Scale 100

rotring NC-scriber 10  
rotring NC-scriber 10

FUNCT 3 INS UP SCALE 2 \* 0 \* 0  
RM M? M \* 0 2 RUN DEL

Scale 200

rotring NC-sc

Scale 075

rotring NC-scriber 10  
rotring NC-scriber 10





Scale 050

rotring NC-scriber 10  
rotring NC-scriber 10

## 5.6 Calling Up Text from Memory

### Important

The identical type-style cassette must be used for input and output.

- Using keys  , position the scriber arm so that it can move freely.
- Select the memory by pressing  and keying in the 2-digit address.
- Moving the entire operating unit, bring the scribing tool into the starting position.
- Press  to start output.




### Note

If beeper sounds during call-up, scriber arm range has been exceeded.



## 5.7 Calling Up Memory Contents in a Different Scale

### Note

Character height as programmed during input = 100%.

- Activate the scale function by pressing  .
- Key in the new scale as a 3-digit percentage.
- Call up the memory by pressing  followed by the 2-digit address.

### Note

Before commencing output, check the required space with PEN UP by pressing  .

- Press  to start output.

M?



Present  
memory  
address

After checking:  
Return to present  
memory address

Memory address      Remaining free capacity      Character height:  
5.0 mm

01.3750 TH005.0

Cursor



## 5.8 Checking the Memory Contents on the LCD

All stored data, including the instruction code, can be read and, if necessary, edited on the LCD by pressing followed by 2 addresses.

To read or change the contents at one address **without transferring it**, key in the address, a comma, and again the same address.

Example: 02,02.

To check data without transfer:

- ① Press .
- ② Key in the 2-digit address.
- ③ Press and repeat step ②.

- ④ To commence reading, press .

Use and to move the cursor or the text on the LCD in steps to the left or to the right.

For continuous motion, hold down the key.

On the LCD the memory contents will always be preceded by memory address, free capacity and instruction code.

### Instruction code

TH	Character ("type") height
TW	Character width
TA	Character inclination ("angle")
W	Wait for RUN
T/	Text to follow
RM	End of keyed instructions
*	Separation of 2 instructions

### Instruction code

Memory contents displayed on the LCD consist of 2 types of data:

- The instruction code preceding the contents
- The contents proper, made up of text or symbols that can be printed out.

### EXAMPLE

Contents of memory address 02:

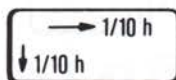
Character height 5 mm  
Character width 100% (regular)  
Character inclination 75°  
Text: rotring NC-scriber

Access to memory for checking contents



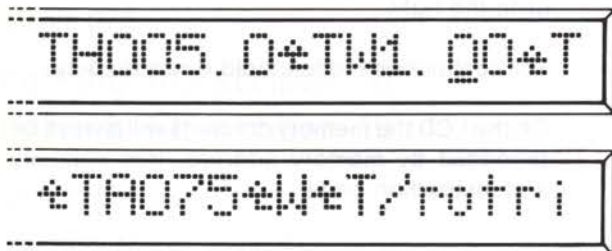
### Example

shown on left.



Read LCD

### LCD



The LCD shows:

Character height (TH) = 5.0 mm  
Character width (TW) = 100%

The LCD shows:

Character inclination (TA) = 75°

The code (automatically registered during input)

"Wait for Run" (W)

"Text to follow" (T/)

and the text itself.

### 5.9 Changing Memory Contents

#### Changing without transfer

To read and change the contents at one address **without transferring it**, key in the address, a comma, and again the same address.

Example: 02,02

#### Important

Whenever you are storing a special function, return to the regular operation/function **before closing** memory.

#### Transfer and change at a new address




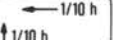
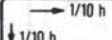
To change data at a new address while keeping it unchanged at the present address, key in the present address, a comma, and the new address.

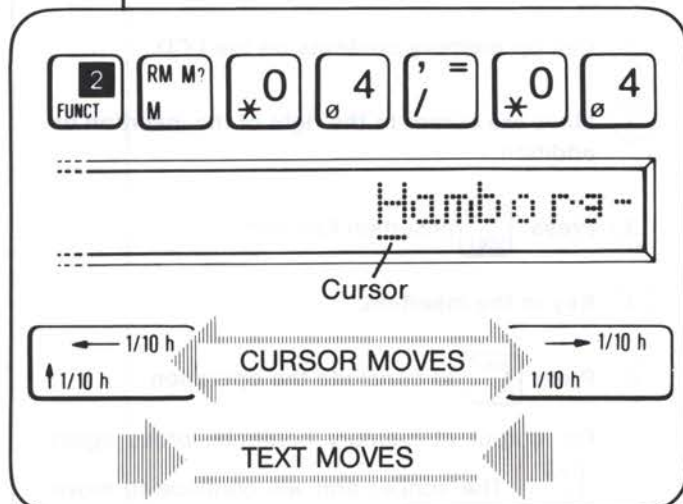
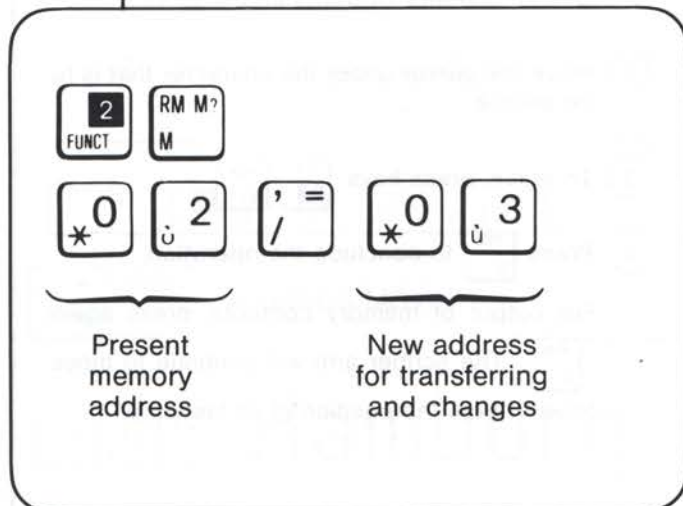
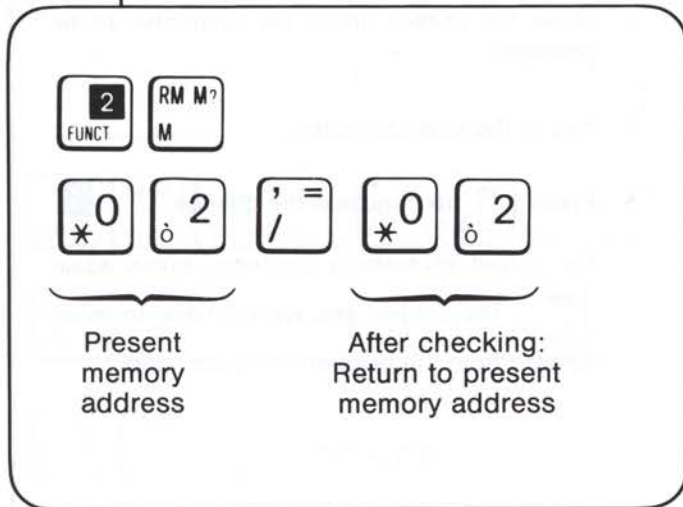
Example: 02,03.

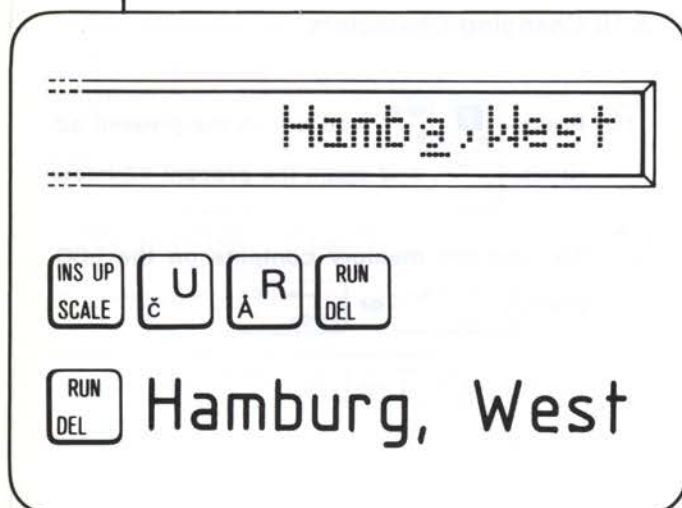
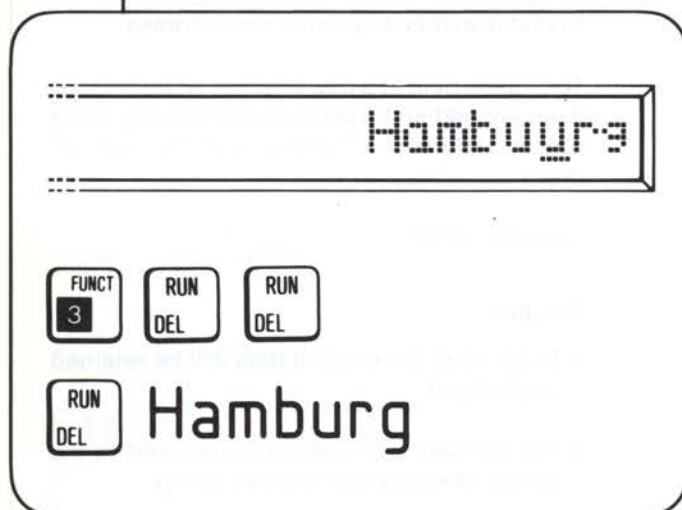
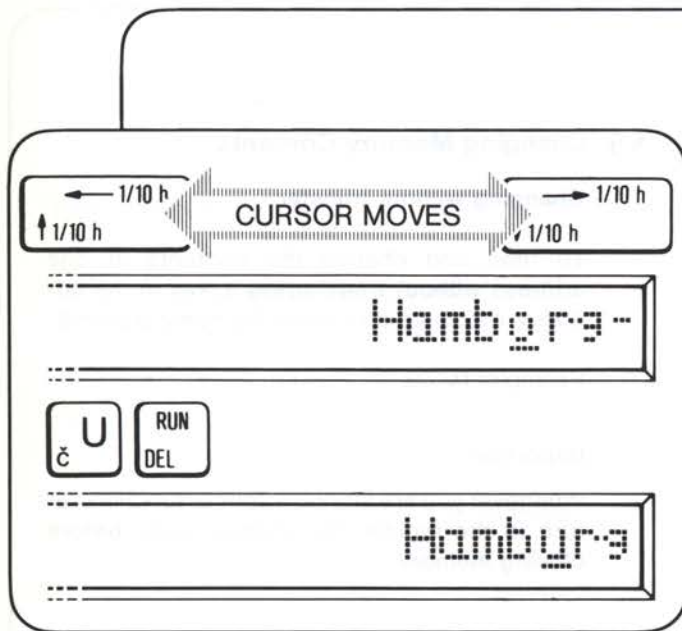
#### Results:

1. In 02, all of the original data will be retained unchanged.
2. The 02 data will also be transferred to 03, where changes can then be made.

### 5.10 Changing Characters

- 1 Press   and key in the present address, , and again the present address.
- 2 To read the memory contents on the LCD, press  or .





③ Move the cursor under the character to be changed.

④ Key in the new character.

⑤ Press **RUN DEL** to conclude the change.

For output of memory contents, press again **RUN DEL**. The scriber arm will continue to move forward from the position of its last stop.

### 5.11 To Erase a Character

① Call up memory contents on the LCD.

② Move the cursor under the character that is to be erased.

③ To erase, press keys **FUNCT 3** **RUN DEL**.

④ Press **RUN DEL** to conclude the operation.

For output of memory contents, press again **RUN DEL**. The scriber arm will continue to move forward from the position of its last stop.

### 5.12 Inserting or Adding a Character

① Call up memory contents on the LCD.

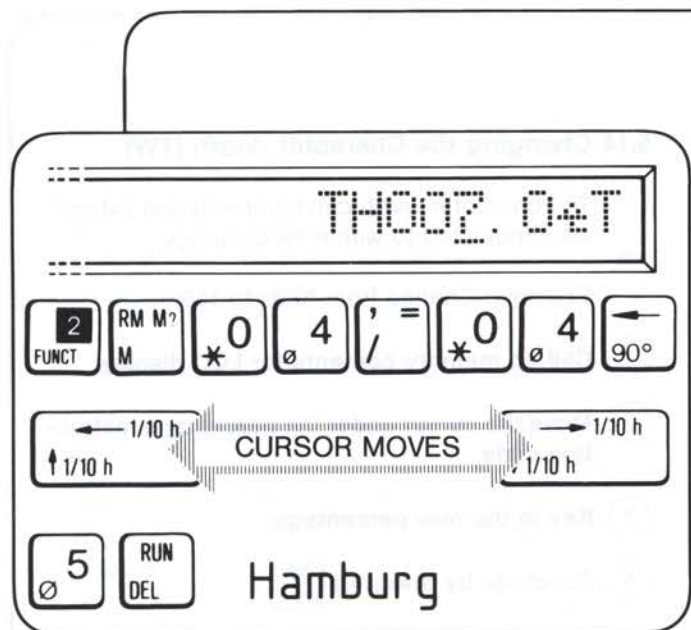
② Move the cursor to the right of the insertion or addition.

③ Press **INS UP SCALE** (insertion function).

④ Key in the insertion.

⑤ Press **RUN DEL** to conclude the operation.

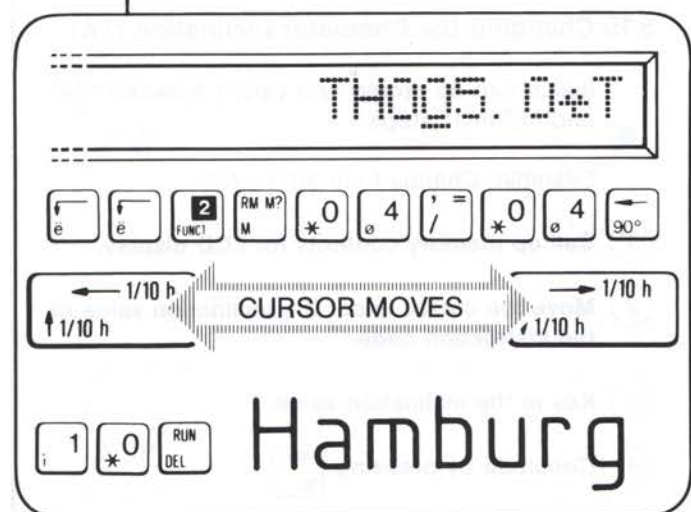
For output of memory contents, press again **RUN DEL**. The scriber arm will continue to move forward from the position of its last stop.



### 5.13 Changing the Character Height (TH)

Example: Reducing the character height from 7 mm to 5 mm.

- ① Call up memory contents on the LCD.
- ② Move the cursor under the instruction code for character height.
- ③ Key in the new character height.
- ④ Conclude by pressing .

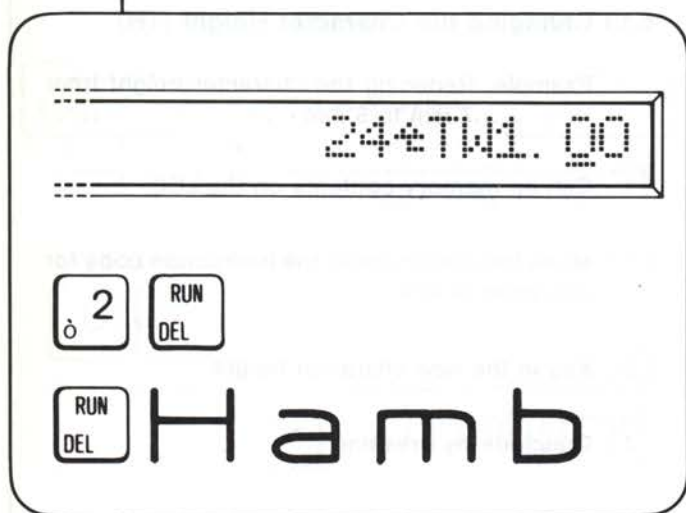


Example: Enlarging the character height from 5 mm to 10 mm.

- ① Using key , position the scriber arm so that it can move freely.
- ② Call up memory contents on the LCD.
- ③ Move the cursor under the number that is to be changed.
- ④ Key in the new height (10).
- ⑤ Conclude by pressing .

#### Note


If beeper sounds during call-up, scriber arm range has been exceeded.



#### 5.14 Changing the Character Width (TW)

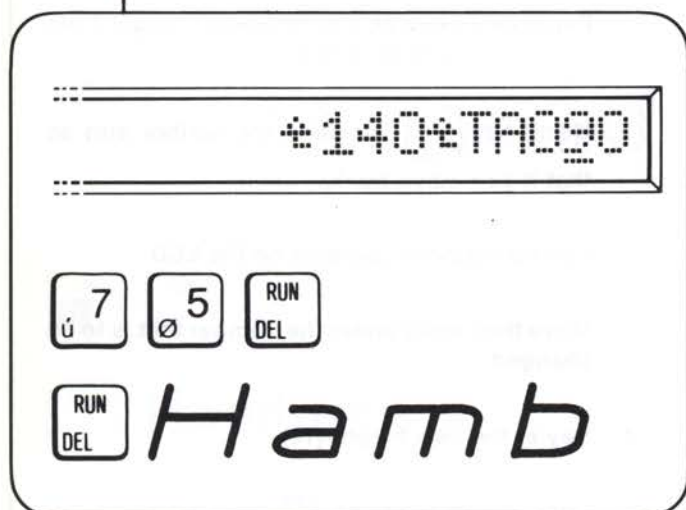
The character width can be stored and extended/condensed to within 1% accuracy.

Example: Change from 100% to 140%.

- ① Call up memory contents for LCD display.
- ② Move the cursor under the percentage instruction code.
- ③ Key in the new percentage.
- ④ Conclude by pressing .

#### Note


Your space requirements will change.



#### 5.15 Changing the Character Inclination (TA)


Italics can be stored and varied between 134° and 46° in 1° steps.

Example: Change from 90° to 75°.



- ① Call up memory contents for LCD display.
- ② Move the cursor under the inclination value of the instruction code.
- ③ Key in the inclination value.
- ④ Conclude by pressing .

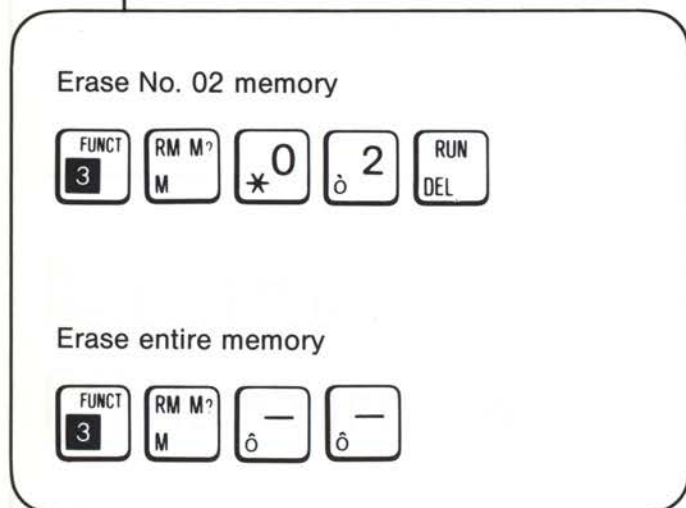
#### 5.16 Erasing the Memory Contents

##### Erasing at one address

- ① Call up the memory.
- ② Key in the memory address.
- ③ Press  to erase the contents.

##### Erasing the contents of the entire memory

- ① Call up the memory.
- ② Press   to erase contents.





Art. 691 634



Art. 691 635



Art. 691 511



Art. 691 532

## 6.1 Keyboard à la Typewriter

Keyboard TW has the keys arranged in the fashion of a typewriter rather than in the standard alphanumeric order. Note, however, that this model calls for the use of cassettes marked TW (typewriter).

### Art.No.

Keyboard TW ..... 691 635

Type-style cassettes:

ISO 3098 TW ..... 691 829  
DIN 17 ..... 691 838  
DIN 1451 ..... 691 872  
Universal ..... 691 833

## 6.2 Keyboard "Technical"

Keyboard "Technical" has alphanumeric key arrangement and includes some of the most frequently used mathematical symbols; it requires the use of a special type-style cassette.

### Art.No.

Keyboard ..... 691 511

Type-style cassette  
"Technical" ..... 691 831

Keyboard "TW - Technical" ..... 691 532



### 6.3 NC-scriber for Left-Handers

An adapter, Art.No. 691 039, is available for attaching the NC-scriber to drafting machines for left-handers.

### 6.4 Expanded Storage Capacity

The capacity of the working memory can be expanded by an additional 12 Kbyte. Art.No. 691 507.



### 6.5 Carrying Case

A sturdy case, Art.No. 691 516, is available for transport and storage of your NC-scriber.

The case is made of black polyester-fiber coated wood, edges and corners are reinforced with anodized light alloy, there are two locks and a handle.

Size: 170 x 460 x 420 mm  
(6 3/4 x 18 1/4 x 16 3/4 in.)

Empty weight: 4 200 g



**7.1 Control Unit NC-ad 1010**

Power requirements	Voltage switch for either 115 or 230 VAC $\pm 10\%$ , 50 / 60 Hz
Power consumption	100 W
Fuse	1.6 A delayed
Size	300 x 200 x 98 mm
Weight	2850 g
Identification plate	Rear panel
Operational memories	CMOS-RAMs, 4 Kbyte, buffered for min. of 2 years. Option: 16 Kbyte.
Memory capacity	99 addresses for max. 2,500 instructions
Mains cable	ca. 2 m
Control cable	3.5 m (option 6 m)

**7.2 Cassettes**

Storage medium	EPROMs
Storage capacity	16 Kbyte
Operational indicator	Green LED
Size	120 x 70 x 16 mm

**7.3 Operating Unit rotring NC-scriber**

Operating voltage	$\pm 5\text{ V}$ , $\pm 12\text{ V}$
Keyboard	68 input keys, arranged alphanumerically
Optional	Special keyboards
Scribing tools	Drawing pens with standard thread for cap, adapter for fibre-tip pens
Range of scriber arm	X axis 190 mm, Y axis 42 mm
Character height	1.0 mm to 30.0 mm in 0.1 mm increments
Writing style	As determined by any of various type-style cassettes
Character width	Adjustable in 1% steps
Accuracy	Line resolution of 0.01 mm
Writing / drawing speed	About 2 characters/s at 3.5 mm character height, adjustable to 0.5 or 2 cm/s
Display	16-character LCD, with cursor
Size	335 x 168 x 38 mm
Weight, control cable included	ca. 1690 g
Identification plate	On the underside of the unit





Keys have multiple functions

Direct input : Press input key

2nd function : followed by input key

3rd function : followed by input key

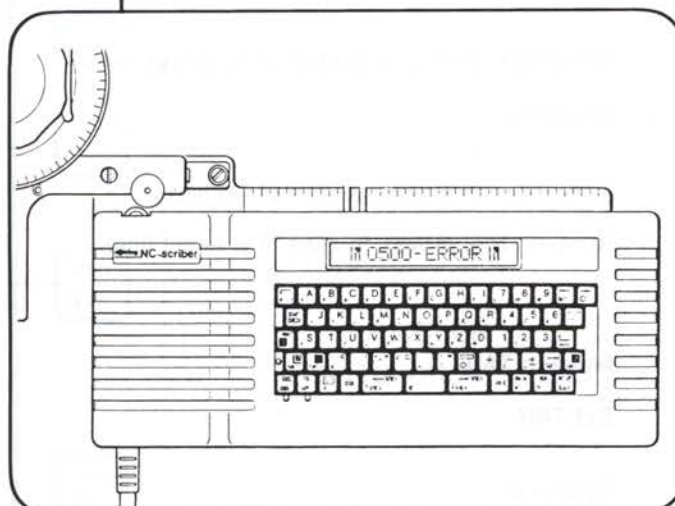
### 8.1 Functions, Standard Keyboard

Use the Table of Keyboard Functions (next 2 pages) in conjunction with the foldout illustration on the inside of the back cover.

		Function	Sect.
01		Raster on	3.13
02		Raster off	
07		Type-style cassette (upper)	4.7
08		Type-style cassette (lower)	
11		Character width change (TW)	3.3
12		Writing / drawing speed	3.4
51		Line type 1 _____	4.4
52		Line type 2 -----	
53		Line type 3 -.-.-.-.-	

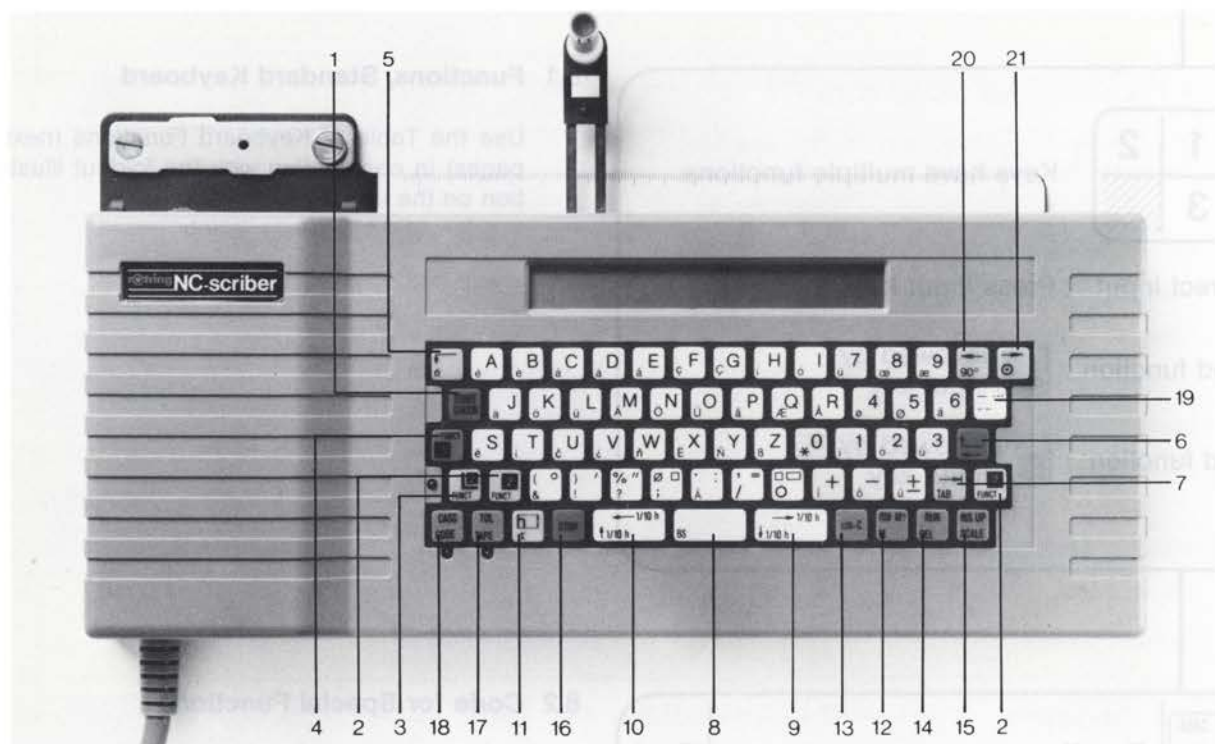
### 8.2 Code for Special Functions

A number of special functions, e.g. raster-size or extended/condensed writing, are activated by pressing and keying in a code number.

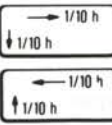













Wrong input or malfunction will set off beeper, "ERROR" with code symbol on LCD.

See Sect. 8.3 for the ERROR Code Table.















Key	No.	Function
	1	Scribing tool moves to zero coordinate point. Character height 3.5 mm, direct input, LED off.
	2	Single capital letter or symbol of 2nd function. LED lit.
	3	Continuous capital letters or symbols of 2nd function. LED lit.
	4	Single character or symbol of 3rd function.
	5	DIRECT & 2nd FUNCTION ..... Scribing tool moves to start of next line. 3rd FUNCTION ..... Character ë
	6	DIRECT & 2nd FUNCTION ..... Scribing tool moves to start of 1st line. 3rd FUNCTION ..... Scribing tool moves to start of present line.
	7	TABULATOR DIRECT & 2nd FUNCTION ..... Move to TAB. 3rd FUNCTION ..... Set TAB.
	8	DIRECT & 2nd FUNCTION ..... Spacebar. 3rd FUNCTION ..... Backspace key: Scribing tool moves back by 1 character. Correction during memory input.

Key	No.	Function
	9, 10	<p>DIRECT &amp; 2nd FUNCTION ..... Stepping key: Scribing tool moves in direction of arrows — horizontally in steps 1/10 h</p> <p>2nd FUNCTION ..... During memory call-up the stepper function (spacing) can be inserted into memory (stepping key left/right)</p> <p>3rd FUNCTION ..... — vertically in steps 1/10 h</p>
	11	<p>DIRECT &amp; 2nd FUNCTION ..... Select character height, key in with 1/10 mm accuracy.</p> <p>3rd FUNCTION ..... Select character inclination.</p>
	12	<p>DIRECT ..... Call up memory for output of contents (after keying in address).</p> <p>2nd FUNCTION ..... Call up memory for display on LCD or change of contents.</p> <p>3rd FUNCTION ..... Call up memory for input at an address.</p>
	13	<p>DIRECT &amp; 2nd FUNCTION ..... Correction during input into memory.</p> <p>3rd FUNCTION ..... No function assigned</p>
	14	<p>DIRECT &amp; 2nd FUNCTION ..... Instruction to execute.</p> <p>3rd FUNCTION ..... Erasing an instruction in the memory.</p>
	15	<p>DIRECT ..... Insertion of character or symbol in memory already programmed.</p> <p>2nd FUNCTION ..... Scribing tool motion with PEN UP.</p> <p>3rd FUNCTION ..... Initiate change of scale (in %) prior to call-up from memory or cassette.</p>
	16	<p>ALL FUNCTIONS ..... Instant stop of writing or drawing process.</p>
	17	<p>DIRECT &amp; 2nd FUNCTION ..... Initiate tolerance function for tolerance data, subscripts, superscripts.</p> <p>3rd FUNCTION ..... No function assigned.</p>
	18	<p>DIRECT &amp; 2nd FUNCTION ..... Switch to cassette programme. LED lit.</p> <p>3rd FUNCTION ..... Precedes a code, e.g. 01, Raster-size characters.</p>
	19	<p>DIRECT ..... Continuous line</p> <p>2nd FUNCTION ..... Intermittent line</p> <p>3rd FUNCTION ..... Dash-dot-dash line</p>
	20	<p>DIRECT ..... Draw left dimensioning arrow. Move text, characters on LCD.</p> <p>2nd FUNCTION ..... Writing direction back to normal after rotation.</p> <p>3rd FUNCTION ..... The writing and drawing direction can be rotated in 90° steps. Input: 090 - 180 - 270.</p>
	21	<p>DIRECT &amp; 2nd FUNCTION ..... Draw right dimensioning arrow. Move text, characters on LCD.</p> <p>3rd FUNCTION ..... Initiate circle program. Followed by 4-digit input with 1/10 mm accuracy.</p>

### 8.3 Error Code

Wrong input or function will set off beeper, ERROR with code on LCD.

ERROR CODE		Remedy
	Type-style cassette does not correspond with inserted text cassette	Insert a cassette with the type-style of the text
	Character height exceeded	Key in acceptable height
	Character inclination exceeded	Key in acceptable inclination
	Keys pressed in wrong sequence	Follow correct sequence
	Wrong diameter input	Key in acceptable diameter
	Memory (address) empty	Call up correct address
	Relative values (for CC, CR, CL, S) too large	Key in acceptable values
	Memory (address) filled to capacity, input ignored	Close memory (address), erase / transfer contents not needed
	Scale too large	Reduce scale
	Memory contents deficient	Repeat input If again ERROR code D, contents destroyed Erase entire memory
	Wrong code number	Key in correctly
	Cassette defective or not inserted	Replace or insert cassette

Service

